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Remarks

The specification has been amended to add an ABSTRACT OF THE DISCLOSURE after the Claims section. Applicants now believe the Specification is in compliance with 37 C.F.R. 1.72(b).

Claims 1-21 were presented for examination. Claims 1-21 were rejected.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hayard. Applicants respectfully traverse.

Claim 1, in part, recites determining the position and orientation of a tool by imaging points on a predetermined area of the tool related to a measuring element even when those points may be obscured.

This rejection is without any reasonable basis. There is simply no cogent explanation of the deficiency in the Hayard patent disclosure, nor is there a reason given as to why a person of ordinary skill would be led by the Hayard patent disclosure to cure this deficiency.

Hayard discloses the use of a barcode scanner to detect the position and orientation of a surface which is marked with four one-dimensional bar codes. The barcodes are disclosed as UPC barcodes, two of which are positioned along one axis and the other two are positioned along another axis orthogonal to the first axis. The Examiner admits Hayard fails to explicitly disclose "the part of the mark happens to be obscured" but states that one "can take the Hayard's disclosure for reorganization of the 3D mark and could create the 3D image of any obscured mark for the purpose of 3D creation."

However, for a barcode to be read correctly, both the special start and stop characters must be discernable and readable (Fig. 1, end marks 11 and 12) and the checksum character (Fig. 1, reference 18) read must match the checksum character printed. If the characters are not read

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properly, the barcode will not be read in full and the information will not be collected. In Hayard, if the barcode information is not collected, the calculations will be erroneous because the determination of position and orientation is based on where and when a barcode was properly read in full by the scanner (Col. 4, lines 46-68, Col. 5, lines 1-11; Figs. 3 and 4). Therefore, it is imperative in Hayard that the barcodes not be obscured. Fig. 2, in Hayard, referred to by the Examiner, simply demonstrates how position and orientation measurements are gathered by correctly and properly reading the barcodes (Fig. 2; Col. 4, lines 34-53).

In fact, Hayard teaches away from using imaging the object, as disclosed in the claimed invention. Hayard states that barcodes are much easier to read than it is to analyze an image of an object (Col. 4, lines 14-16). In addition, Hayard makes no mention of a situation where the barcodes have become obscured by dirt or dust and not properly readable, nor how one would deal with such a situation. Consequently, Applicants assert that not all of the elements of claim 1 are shown or suggested by Hayard. Further, Hayard does not recognize the problem nor suggest a solution to the problem. Therefore, the Applicants assert that the rejection is unsupported by Hayard and request that the Examiner withdraw his rejections to claim 1.

Claim 10 also recites the limitation of determining position and orientation when the image of one of the markers is partially obscured. Therefore, for the same reasons stated above, Applicants assert that not all of the elements of claim 10 are shown or suggested by Hayard. Therefore, the Applicants believe the rejection is also unsupported by Hayard and request that the Examiner withdraw his rejection of claim 10.

Claims 2-9 and 11-21 depend from the independent claims 1 and 10 either directly or ultimately. These dependent claims are patentable for the same reasons as presented above with respect to the claims from which they depend. Further, the dependent claims also include additional limitations which distinguish them from Hayard. For instance, claims 6 and 19 recite detecting the point of balance of the marker and using it as the measuring point which is not taught nor suggested by Hayard. Additionally, claim 14 specifies that the markers extend along a line from one side of the tool to the other. In contrast, Hayard discloses placing the patterns "as


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far apart as possible from one another" (Col. 4, lines 25-26). Consequently, Applicants assert that not all of the elements of claims 2-9 and 11-21 are shown or suggested by Hayard. Therefore, the Applicants believe the rejections based on Hayard are improper, and request that the Examiner withdraw his rejections to these claims.

Conclusion

For the above reasons, the Applicants respectfully submit that the above claims represent allowable subject matter. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,
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